

LISTING OF CLAIMS

The listing of claims provided below replaces all prior versions, and listings, of claims in the application.

1. (Currently Amended) An apparatus for depositing a planarizing layer over a wafer, comprising:

a tank defined by a bottom and an enclosing wall, the tank being configured to contain an electroless plating solution;

a wafer support structure disposed within the tank, the wafer support structure being configured to support a wafer at a submerged position within the electroless plating solution to be contained within the tank;

a planar member disposed above and substantially parallel to the wafer support structure, ~~the planar member being movable in a direction toward the wafer support structure and in a direction away from the wafer support structure~~, the planar member capable of being positioned proximate to the wafer to be supported by the wafer support structure such that the planar member serves as an upper confinement boundary for material deposited on the wafer through electroless plating reactions; and

a radiant energy source disposed above the planar member and above the wafer support structure, the radiant energy source being oriented to direct radiant energy through the planar member and to the wafer to be supported by the wafer support structure.

2. (Original) An apparatus for depositing a planarizing layer over a wafer as recited in claim 1, the planar member being composed of a material capable of transmitting radiant energy emitted from the radiant energy source toward the wafer support structure.

3. (Original) An apparatus for depositing a planarizing layer over a wafer as recited in claim 2, wherein the planar member is formed from one of quartz, sapphire, and polymer.

4. (Original) An apparatus for depositing a planarizing layer over a wafer as recited in claim 1, wherein the radiant energy source is configured to generate radiant energy having a wavelength range that is capable of selectively heating a material present at a surface of the wafer upon which the radiant energy will be incident.

5. (Original) An apparatus for depositing a planarizing layer over a wafer as recited in claim 1, wherein the radiant energy source is configured to apply a substantially uniform amount of the radiant energy over a surface of the wafer upon which the radiant energy will be incident.

6. (Original) An apparatus for depositing a planarizing layer over a wafer as recited in claim 1, wherein the planar member is broadly flexible and locally rigid.

7. (Original). An apparatus for depositing a planarizing layer over a wafer as recited in claim 1, further comprising:

a backing member disposed against a backside of the planar member, the backside of the planar member facing away from the wafer support structure, the backing member being configured to control a planarity of the planar member.

8. (Original) An apparatus for depositing a planarizing layer over a wafer as recited in claim 1, further comprising:

an inlet for supplying the electroless plating solution to the tank; and
an outlet for removing the electroless plating solution from the tank.

9. (Original) An apparatus for depositing a planarizing layer over a wafer as recited in claim 1, further comprising:

a heat exchanger capable of maintaining a temperature of the electroless plating solution to be contained within the tank.

10-20. (Cancelled)

21. (New) An apparatus for depositing a planarizing layer over a wafer as recited in claim 1, wherein the planar member is capable of being positioned within three micrometers of a top surface of the wafer to be supported by the wafer support structure.

22. (New) An apparatus for depositing a planarizing layer over a wafer, comprising:

a tank defined by a bottom and an enclosing wall, the tank being configured to contain an electroless plating solution;

a wafer support structure disposed within the tank, the wafer support structure being configured to support a wafer at a submerged position within the electroless plating solution to be contained within the tank;

a planar member disposed above and substantially parallel to the wafer support structure, the planar member capable of being positioned proximate to the wafer to be supported by the wafer support structure such that the planar member serves as an upper confinement boundary for material deposited on the wafer through electroless plating reactions; and

a radiant energy source disposed above the planar member and above the wafer support structure, the radiant energy source being oriented to direct radiant energy through the planar member such that a substantially uniform amount of radiant energy is applied to a top surface of the wafer to be supported by the wafer support structure.

23. (New) An apparatus for depositing a planarizing layer over a wafer as recited in claim 22, further comprising:

radiant energy reflecting surfaces disposed within the tank to facilitate uniform application of the radiant energy to the top surface of the wafer.

24. (New) An apparatus for depositing a planarizing layer over a wafer, comprising:

a tank defined by a bottom and an enclosing wall, the tank being configured to contain an electroless plating solution;

a wafer support structure disposed within the tank, the wafer support structure being configured to support a wafer at a submerged position within the electroless plating solution to be contained within the tank;

a planar member disposed above and proximate to the wafer to be supported by the wafer support structure such that the planar member serves as an upper confinement boundary for material deposited on the wafer through electroless plating reactions;

a backing member disposed against a backside of the planar member, the backside of the planar member facing away from the wafer support structure, the backing member being configured to control a planarity of the planar member; and

a radiant energy source disposed to direct radiant energy through the planar member and to the wafer to be supported by the wafer support structure.

25. (New) An apparatus for depositing a planarizing layer over a wafer as recited in claim 24, wherein the backing member is defined to apply a differential pressure distribution through the planar member to a planarizing surface of the planar member, the planarizing surface of the planar member facing toward the wafer support structure.

26. (New) An apparatus for depositing a planarizing layer over a wafer as recited in claim 25, wherein the backing member includes a distribution of materials having varying spring constants for applying the differential pressure distribution through the planar member.

27. (New) An apparatus for depositing a planarizing layer over a wafer as recited in claim 25, wherein the backing member includes a number of fluid filled chambers for applying the differential pressure distribution through the planar member.